Sub A1

SEQUENCE LISTING

(1) GENERAL INFORMATION

(i) APPLICANT: The Government of the United States of America, as represented by the Secretary, Department of Health and Human Services; UAB Research Foundation; and Wisconsin Alumni Research Foundation

(ii) TITLE OF THE INVENTION: NOVEL IMMUNOTOXINS AND METHODS OF INDUCING IMMUNE TOLERANCE

(iii) NUMBER OF SEQUENCES: 15

(iv) CORRESPONDENCE ADDRESS:
(A) ADDRESSEE: NEEDLE & ROSENBERG, P.C.
(B) STREET: 127 Peachtree Street, N.E., Suite 1200
(C) CITY: Atlanta
(D) STATE: GA
(E) COUNTRY: USA
(F) ZIP: 30303-1811

(v) COMPUTER READABLE FORM:
(A) MEDIUM TYPE: Diskette
(B) COMPUTER: IBM Compatible
(C) OPERATING SYSTEM: DOS
(D) SOFTWARE: FastSEQ for Windows Version 2.0

(vi) CURRENT APPLICATION DATA:
(A) APPLICATION NUMBER:
(B) FILING DATE: 05-MAR-1998
(C) CLASSIFICATION:

(vii) PRIOR APPLICATION DATA:
(A) APPLICATION NUMBER: 60/039,987
(B) FILING DATE: 05-MAR-1997

(viii) ATTORNEY/AGENT INFORMATION:
(A) NAME: Spratt, Gwendolyn D.
(B) REGISTRATION NUMBER: 36,016
(C) REFERENCE/DOCKET NUMBER: 14014.0287/P

(ix) TELECOMMUNICATION INFORMATION:
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(C) TELEX:

(2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 3476 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

AAAAAAAAGC CCGCCGAAGC GGGCTTTATT ACCAAGCGAA GCGCCATTCG CCATTCAGGC 60
TGCGCAACTG TTGGGAAGGG CGATCGGTGC GGGCCTCTTC GCTATTACGC CAGCTGGCGA 120
AAGGGGGATG TGCTGCAAGG CGATTAAGTT GGGTAACGCC AGGGTTTTCC CAGTCACGAC 180
GTTGTAAAAC GACGGCCAGT CCGTAATACG ACTCACTTAA GGCCTTGACT AGAGGGAAGA 240
TCTGGATGCA TTCGCGCGCA CGTACGGTCT CGAGGAATTC CTGCAGGATA TCGTGGATCC 300
AAGCTTCACC ATGGGAGACG TCACCGGTTC TAGAACCTAG GGAGCTCTGG TACCCACTAG 360
TGAGTCGTAT TACGTAACCG CAGGTAAAAG GCATATTTTT CGCGTGTCAT GGCTAGTAAA 420
TAACACCGGT GTCATTTAGA GTCAGGGAAA GACAATGAAA AACGAAGAAA GCCACCGGGC 480
GGCAACCCGA TGACTTTCGC TTATCACCCA GCACACACCT GGGAGAAATC ACGGTCATGA 540
GTTTACAGAC TCATGCGCAG AATGCGCACA CTAAAACACC TACCCGCGTC GAGCGCGACC 600
GTGGTGGACT GGACAACACC CCAGCATCTG CCAGTGACCG CGACCTTTTA CGCGATCATC 660
TAGGCCGCGA TGTACTCCAC GGTTCAGTCA CACGAGACTT TAAAAAGGCC TATCGACGCA 720
ACGCTGACGG CACGAACTCG CCGCGTATGT ATCGCTTCGA GACTGATGCT TTAGGACGGT 780
GCGAGTACGC CATGCTCACC ACCAAGCAGT ACGCCGCCGT CCTGGTCGTA GACGTTGACC 840
AAGTAGGTAC CGCAGGCGGT GACCCCGCAG ACTTAAACCC GTACGTCCGC GACGTGGTGC 900
GCTCACTGAT TACTCATAGC GTCGGGCCAG CCTGGGTGGG TATTAACCCA ACTAACGGCA 960
AAGCCCAGTT CATATGGCTT ATTGACCCTG TCTACGCTGA CCGTAACGGT AAATCTGCGC 1020
AGATGAAGCT TCTTGCAGCA ACCACGCGTG TGCTGGGTGA GCTTTTAGAC CATGACCCGC 1080
ACTTTTCCCA CCGCTTTAGC CGCAACCCGT TCTACACAGG CAAAGCCCCT ACCGCTTATC 1140
GTTGGTATAG GCAGCACAAC CGGGTGATGC GCCTTGGAGA CTTGATAAAG CAGGTAAGGG 1200
ATATGGCAGG ACACGACCAG TTCAACCCCA CCCCACGCCA GCAATTCAGC TCTGGCCGCG 1260
AACTTATCAA CGCGGTCAAG ACCCGCCGTG AAGAAGCCCA AGCATTCAAA GCACTCGCCC 1320
AGGACGTAGA CGCGGAAATC GCCGGTGGTC TCGACCAGTA TGACCCGGAA CTTATCGACG 1380
GTGTGCGTGT GCTCTGGATT GTCCAAGGAA CCGCAGCACG CGACGAAACA GCCTTTAGAC 1440
ATGCGCTTAA GACTGGCCAC CGCTTGCGCC AGCAAGGCCA ACGCCTGACA GACGCAGCAA 1500
TCATCGACGC CTATGAGCAC GCCTACAACG TCGCACACAC CCACGGCGGT GCAGGCCGCG 1560
ACAACGAGAT GCCACCCATG CGCGACCGCC AAACCATGGC AAGGCGCGTG CGCGGGTATG 1620
TCGCCCAATC CAAGAGCGAG ACCTACAGCG GCTCTAACGC ACCAGGTAAA GCCACCAGCA 1680
GCGAGCGGAA AGCCTTGGCC ACGATGGGAC GCAGAGGCGG ACAAAAAGCC GCACAACGCT 1740
GGAAAACAGA CCCCGAGGGC AAATATGCGC AAGCACAAAG GTCGAAGCTT GAAAAGACGC 1800
ACCGTAAGAA AAAGGCTCAA GGACGATCTA CGAAGTCCCG TATTAGCCAA ATGGTGAACG 1860
ATCAGTATTT CCAGACAGGG ACAGTTCCCA CGTGGGCTGA AATAGGGGCA GAGGTAGGAG 1920
TCTCTCGCGC CACGGTTGCT AGGCATGTCG CGGAGCTAAA GAAGAGCGGT GACTATCCGG 1980
ACGTTTAAGG GGTCTCATAC CGTAAGCAAT ATACGGTTCC CCTGCCGTTA GGCAGTTAGA 2040
TAAAACCTCA CTTGAAGAAA ACCTTGAGGG GCAGGGCAGC TTATATGCTT CAAAGCATGA 2100
CTTCCTCTGT TCTCCTAGAC CTCGCAACCC TCCGCCATAA CCTCACCGAA TTGTGGGCCA 2160
TCGCCCTGAT AGACGGTTTT TCGCCCTTTG ACGTTGGAGT CCACGTTCTT TAATAGTGGA 2220
CTCTTGTTCC AAACTGGAAC AACACTCAAC CCTATCTCGG GCTATTCTTT TGATTTATAA 2280
GGGATTTTGC CGATTTCGGC CTATTGGTTA AAAAATGAGC TGATTTAACA AAAATTTAAC 2340
GCGAATTTTA ACAAAATATT AACGTTTACA ATTTAAATAT TTGCTTATAC AATCTTCCTG 2400
TTTTTGGGGC TTTTCTGATT ATCAACCGGG GTAAATCAAT CTAAAGTATA TATGAGTAAA 2460
CTTGGTCTGA CAGTTACCAA TGCTTAATCA GTGAGGCACC TATCTCAGCG ATCTGTCTAT 2520
TTCGTTCATC CATAGTTGCC TGACTCCCCG TCGTGTAGAT AACTACGATA CGGGAGGGCT 2580
TACCATCTGG CCCCAGTGCT GCAATGATAC CGCGAGACCC ACGCTCACCG GCTCCAGATT 2640
TATCAGCAAT AAACCAGCCA GCCGGAAGGG CCGAGCGCAG AAGTGGTCCT GCAACTTTAT 2700
CCGCCTCCAT CCAGTCTATT AATTGTTGCC GGGAAGCTAG AGTAAGTAGT TCGCCAGTTA 2760
ATAGTTTGCG CAACGTTGTT GCCATTGCTA CAGGCATCGT GGTGTCACGC TCGTCGTTTG 2820
GTATGGCTTC ATTCAGCTCC GGTTCCCAAC GATCAAGGCG AGTTACATGA TCCCCCATGT 2880
TGTGCAAAAA AGCGGTTAGC TCCTTCGGTC CTCCGATCGT TGTCAGAAGT AAGTTGGCCG 2940
CAGTGTTATC ACTCATGGTT ATGGCAGCAC TGCATAATTC TCTTACTGTC ATGCCATCCG 3000
TAAGATGCTT TTCTGTGACT GGTGAGTACT CAACCAAGTC ATTCTGAGAA TAGTGTATGC 3060
GGCGACCGAG TTGCTCTTGC CCGGCGTCAA CACGGGATAA TACCGCGCCA CATAGCAGAA 3120
CTTTAAAAGT GCTCATCATT GGAGAACGTT CTTCGGGGCG AAAACTCTCA AGGATCTTAC 3180
CGCTGTTGAG ATCCAGTTCG ATGTAACCCA CTCGTGCACC CAACTGATCT TCAGCATCTT 3240
TTACTTTCAC CAGCGTTTCT GGGTGAGCAA AAACAGGAAG GCAAAATGCC GCAAAAAAGG 3300
GAATAAGGGC GACACGGAAA TGTTGAATAC TCATACTCTT CCTTTTTCAA TATTATTGAA 3360

GCATTTATCA GGGTTATTGT CTCATGAGCG GATACATATT TGAATGTATT TAGAAAAATA 3420
AACAAATAGG GGTTCCGCGC ACATTTCCCC GAAAAGTGCC ACCTGACGTA GTTAAC 3476

(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 21 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

GACATCCAGA TGACCCAGAC C 21

(2) INFORMATION FOR SEQ ID NO:3:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 58 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

CCTCCCGAGC CACCGCCTCC GCTGCCTCCG CCTCCTTTTA TCTCCAGCTT GTGTCGCC 58

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 56 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

GCAGCGGAGG CGGTGGCTCG GGAGGGGGAG GCTCGGAGGT GCAGCTTCAG CAGTCT 56

(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 32 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

GCAAGCTTGA AGACTGTGAG AGTGGTGCCT TG 32

(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 37 base pairs

(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

GTCTCTTCAA AGCTTATTGC CTGAGCTGCC TCCCAAA 37

(2) INFORMATION FOR SEQ ID NO:7:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 32 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

GCATCTAGAT CAGTAGCAGG TGCCAGCTGT GT 32

(2) INFORMATION FOR SEQ ID NO:8:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 59 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

CGGTCGACAC CATGGAGACA GACACACTCC TGTTATGGGT ACTGCTGCTC TGGGTTCCA 59

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 51 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

GTACTGCTGC TCTGGGTTCC AGGTTCCACT GGGGACATCC AGATGACCCA G 51

(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 67 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

ATGAAATACC TATTGCCTAC GGCAGCCGCT GGATTGTTAT TACTGCGCTG CCCAACCAGC 60
GATGGCC 67

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 54 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

ATGAAATACC TATTGCCTAC GGCAGCCGCT GGATTGTTAT TACTCGCTGC CCAA 54

(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 59 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

GGATTGTTAT TACTCGCTGC CCAACAAGCG ATGGCCGGCG CTGATGATGT TGTTGATTC 59

(2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 31 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

CGGTACTATA AAACTCTTTC CAATCATCGT C 31

(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 31 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

GACGATGATT GGAAAGAGTT TTATAGTACC G 31

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 41 base pairs

(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

AGATCTGTCG A/CTCATCAGC TTTTGATTTC AAAAAATAGC G 41